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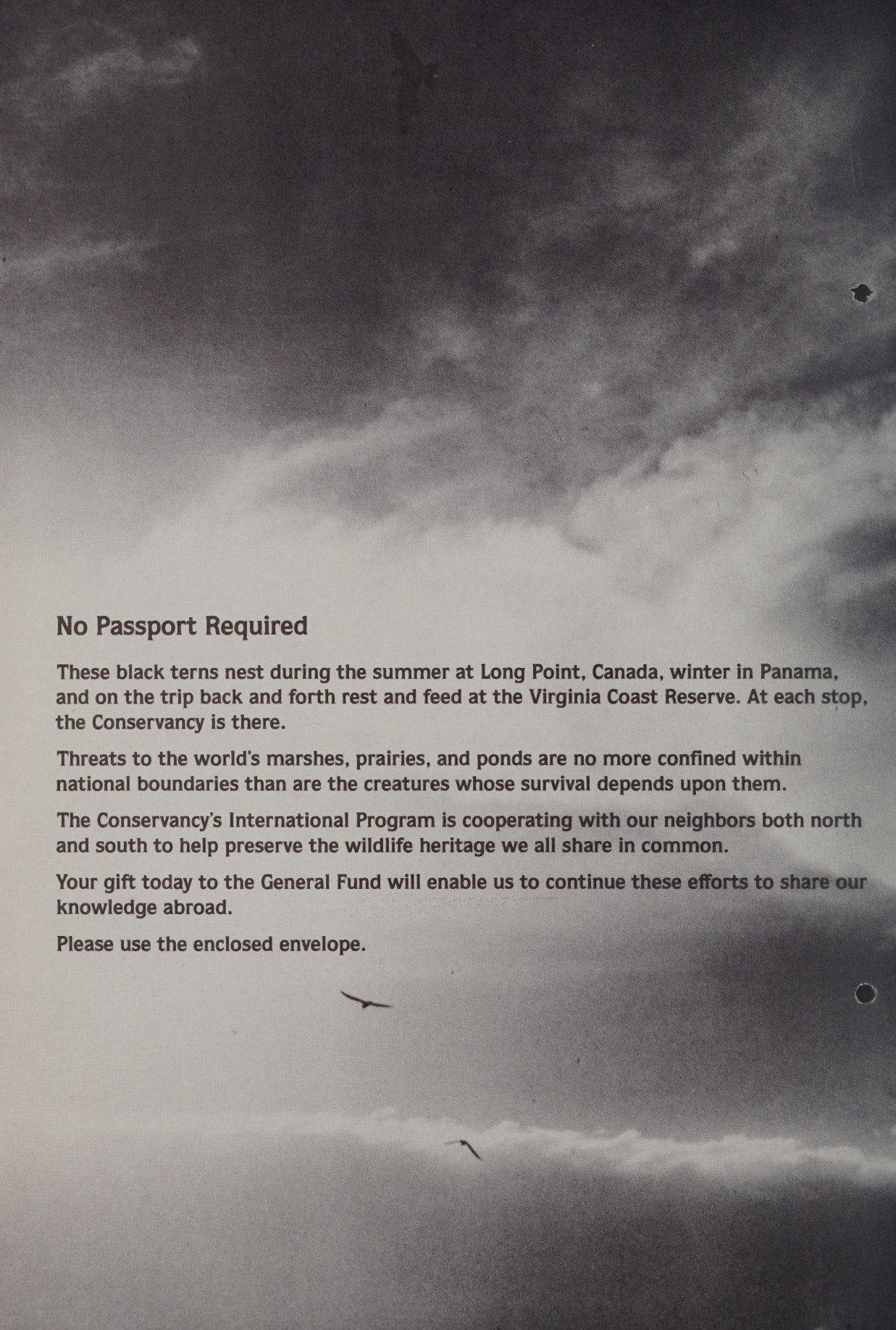

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These black terns nest during the summer at Long Point, Canada, winter in Panama, and on the trip back and forth rest and feed at the Virginia Coast Reserve. At each stop, the Conservancy is there.

Threats to the world's marshes, prairies, and ponds are no more confined within national boundaries than are the creatures whose survival depends upon them.

The Conservancy's International Program is cooperating with our neighbors both north and south to help preserve the wildlife heritage we all share in common.

Your gift today to the General Fund will enable us to continue these efforts to share our knowledge abroad.

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THE NATURE CONSERVANCY NEWS

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To date the Conservancy and its members have been responsible for the preservation of 1,527,293 acres of forests, marshes, prairies, mountains, and islands: home to rare and endangered species of wildlife and plants. 2,171 projects have been completed since the acquisition of the first preserve in 1954. Approximately 60% of all preserves are retained by the Conservancy and managed by volunteer land stewards.

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Conservation Beyond our Borders

by Thomas E. Lovejoy
Program Scientist, World Wildlife Fund

One of the most important international events of the past year took place not in one of the world's great metropolitan centers, nor at a conference table, but rather in an out-of-the-way montane forest in Mexico. There, in the state of Jalisco, a new species of plant was found. It was not very impressive in appearance, being rather the kind any gardener would weed out with hardly a moment's pause. Certainly it would not charm with its beauty, or convince bureaucrats or businessmen that a development project should be stopped or modified for its protection.

Yet an important advance in human welfare was tied up in the relatively unlikely discovery, for the seemingly insignificant weed—found by Wisconsin botanist Hugh Iltis, following the suggestion of a Mexican scientist—is a species of wild corn new to science. The new species is particularly interesting because it is a perennial, as opposed to the annual form of corn currently grown agriculturally, which must be sown every spring. But of greater significance is that the new corn species—in contrast to one other known perennial species—has the same number of chromosomes as our domestic variety, meaning that the two species could be crossbred.

Although much careful work by specialists in corn genetics must come first, perennial crops of corn are now a distinct possibility. Without annually requisite plowing and sowing, there can be considerable savings in both fossil fuel energy and human labor. Soil would be turned less frequently by the plow, diminishing the problem of soil erosion; corn, the world's third most important grain, would be measurably cheaper, as would the other products derived from it.

The meaning of this discovery is, in part, its indication of the importance of biological resources for humanity. At this time, it is very unlikely that perennial corn could be produced in a laboratory, and it's very difficult to assess whether it ever could be. Even if it were someday possible, the process would undoubtedly be extremely expensive. In contrast, Nature produced it free of charge.

What other benefits remain to be discovered from the earth's millions of obscure and apparently "useless" species? The perennial corn discovered in Mexico demonstrates that we have only scratched the surface. Indeed, according to Dr. Norman Myers (in his Earthscan Briefing

Document, *What Use is Wildlife?*), today a mere 20 plant species produce 90 percent of the world's food, although some 80,000 species are believed to be edible. Consider that some as yet "untapped" agriculturally useful plant might be grown in marginal or arid lands, or that it might be resistant to certain pest infestations or crop diseases. A specialist in conservation in developing countries, Myers has suggested that the United States may be more irrevocably dependent upon foreign plant and animal species for food, medicine, and industry than on foreign oil.

The corn story is not unique in the sense that such discoveries are continually being made. Even when artificial substitutes are found for a plant or animal species, nature still provides insurance. For example, World War II stimulated increased interest in tropical diseases, particularly malaria, which traditionally had been treated with quinine, derived from the bark of the South American cinchona tree. A synthetic malarial preventative was developed to supplement the quinine supply. However, when the *falciparum* malarias of southeast Asia began to claim a fearsome toll, it was necessary to return once again to the more potent, natural product, quinine.

Fully half of all prescriptions written in the U.S. each year contain a drug of natural origin.

Without the drug digitalis derived from the fox glove (a native of Europe and Morocco), three million Americans might die of heart failure within three days. The Mexican yam provides chemicals that are the basis of oral contraceptives. Current research is determining whether or not the armadillo may provide a cure for leprosy, the albatross for heart disease, the black bear for kidney failure, and the manatee for hemophilia. Meanwhile, after screening 29,000 plants, the U.S. National Cancer Institute has found five possible anti-cancer drugs.

The dependence on biological resources from far-flung places is not particularly obvious to us. When one considers only southern hemisphere hearts of palm—available at a fancy price in the local supermarket—or even chocolate at its increasing price, the products are exotic but hardly life-sustaining. Yet the economic and trade value of species is immense. Much of early world exploration—by Columbus, Mar-

Three species with known or potential medicinal value: the foxglove (top) is the source of digitalis, a drug used as a cardiac stimulant; researchers are currently determining whether the albatross provides a cure for heart disease, and the black bear for kidney failure.

co Polo, and many others—was inspired by the exotic flavors acquired from tropical spice plants. Our dependence on natural resources today can also be quite serious: when India, shocked at the decline of its rhesus monkey populations, and Sierra Leone, similarly concerned about the state of its chimpanzees, placed an embargo on exportation of those species, the action threw the American biomedical enterprise into alarm and disarray.

Agriculture and medicine are not alone in using wild plant and animal species. Plants provide latex (rubber) products, as well as pectin, resins, gums, and insecticides. By using a certain plant's ability to produce hydrocarbons like oil, instead of carbohydrates like sugar, we might eventually be "growing gasoline." Small scale experiments already have indicated that one acre of Euphorbia trees might yield 10 to 50 barrels of oil per year at annual production costs of about $20 per barrel—a cost which may soon be competitive with the price of traditional sources of oil.

We have become an international society of hunters and gatherers, moving biological resources around the globe with hardly a thought, sometimes purely for luxury (Beluga caviar) and often for reasons integral to the survival of our society, such as for medicines.

Another important aspect of the corn discovery is heavy with irony: the wild areas that support the plant, which is potentially invaluable for human welfare, are threatened by obliteration by a burgeoning human population and its basic needs. Yet the answers for many of these needs—in terms of advances in agriculture, medicine, forestry, and fisheries—may lie in the very wild areas that are being destroyed. The potential benefits of a plant species like the Jalisco corn are obviously greater if the natural areas in which they exist are preserved and protected. It is frightening to think how close we probably came to never having the new corn species. If the area had been destroyed before this discovery, who would have mourned the loss of a few "worthless" species? Indeed, Mexican highland forests are one of the most rapidly disappearing habitats in the world; the perennial corn and numerous other as yet unrecognized species may already be endangered. Others almost certainly have already been lost.

"As the natural resources we are currently consuming at an exorbitant pace continue to dwindle—with accompanying inflation and social and political unrest —we will have to turn to other sources, an impossibility if they have not been wisely conserved."

The third significant point about the Jalisco corn is that it was not discovered in this country. If Hugh Iltis had limited his botanical research to the U.S., or if Mexican colleagues and authorities had been unreceptive to his interests, the species would still be unknown and the agricultural industry unenlightened. This is a clear indication that there is no reason to support isolationism either in regard to biological resources and conservation, or with respect to scientific inquiry (assuming, of course, appropriate diplomacy when conducting research in a foreign nation). All people benefit from the discovery of a new species, such as the perennial corn, regardless of where it is found or by whom.

The importance of biological diversity to human welfare cannot be overemphasized. Since the bulk of this diversity occurs in the tropics, conserving tropical ecosystems is vital. (The most conservative estimate is that 25 percent of all plant and animal species occurs in the world's tropical forests, though the real figure may be well over 50 percent.) Most of the nations containing tropical areas are developing countries, few of which have long traditions in conservation or the financial resources needed to take local initiative. By cooperating with these countries in saving their tropical treasure houses, we can create an alliance for protecting biological resources for all the peoples of the world. This is the essence of international conservation.

Furthermore, as the natural resources we are currently consuming at an exorbitant pace continue to dwindle—with accompanying inflation and social and political unrest—we will have to turn to other sources, an impossibility if they have not been wisely conserved. The collapse of the Peruvian anchovy fishery production—in part because of over-fishing—from seven to two million metric tons a year, and the resulting effect on Peru's balance of payments and international credit, is a dra-

matic example of the consequences of exhausting a natural resource.

As a further example, a nation that demolishes a watershed through ill-planned deforestation not only impoverishes its own people, but adds one more increment to global unrest as well. Were the watershed one that affects an important international resource such as the Panama Canal, its destruction could have disturbingly great effects on world economy. Lester Brown has pointed out that the deteriorating relationship of man to nature requires redefinition of the traditional concept of national security.

Because of their vast biological wealth and fragility and because they are very much under pressure, the tropical forests are of special concern to international conservationists. Total annihilation of the forests may seem like a distant phenomenon now, yet their disappearance may have global consequences beyond the effects of major reduction in biological diversity. The largest amount of terrestrially stored carbon, some 340 billion metric tons, is contained in the biomass of the tropical forests. If these forests are destroyed, there is considerable question as to how the release of all that stored carbon would affect global cycles of carbon. A measurable rise in atmospheric carbon dioxide is a possibility which would affect all climates of the globe. While this subject is not well understood, it is thought that there probably would be an increase in average temperatures worldwide, causing the grain-producing region of the U.S. midwest to become dryer and Canada to probably benefit from a longer crop-growing season. Furthermore, with increasing temperatures the polar ice caps may be reduced, causing a rise in sea level and consequently altered coastlines. The extent to which the world order and relationships of nations would be affected by these events is quite unsettling.

Ultimately the largest negative consequence of shifting climates might be the effect on biological reserves and national parks all over the earth. With the destruction of the tropical forests and resulting alterations in climates, we could lose not only the large numbers of plants and animals in the tropics, but possibly the majority of species existing in what we consider to be protected areas in the U.S. as well. The reason for this phenomenon is that during the climatic shifts of the ice age, species were able to move with and adapt to the climatic belts; but our remaining wildernesses will exist only as isolated remnant patches set in an altered landscape. The species in these last wild areas will not have other places to move to. Even if they did, it is not certain that they could do so quickly enough to insure their survival. So, the large array of plants and animals, which we believe are "safe" in preserves and parks, would be permanently and drastically reduced. Their potential ability to benefit humans would be lost as well.

As the example of destroying tropical forests demonstrates, international conservation is, in some instances, indispensable to our national conservation efforts.

"With the destruction of the tropical forests and resulting alterations in climates, we could lose not only the large numbers of plants and animals in the tropics, but possibly the majority of species existing in what we consider to be protected areas in the U.S. as well."

A more specific example is the migratory birds that pass through the U.S. in the spring or that come to stay till late summer or into the fall. Many of these species, such as the warblers, are dependent on wintering habitats and migratory rest stops in Central and South America. It would be futile to protect these birds while they are in North America if their southern habitats are ignored.

To those who may ask "why not let each nation conserve its own resources?", the answer is simple: there is not time to do so, nor are all countries equally endowed with the means to preserve their biological resources. If we work with these nations, we *all* shall benefit.

The challenge is whether the human species will recognize in time its great reliance on plant and animal species and its need to protect them. More important, can we shed our natural tendency to provincialism and adopt a general global view of the need to preserve biological diversity? The need does not stop at our own borders.

Remembrances of a Rain Forest

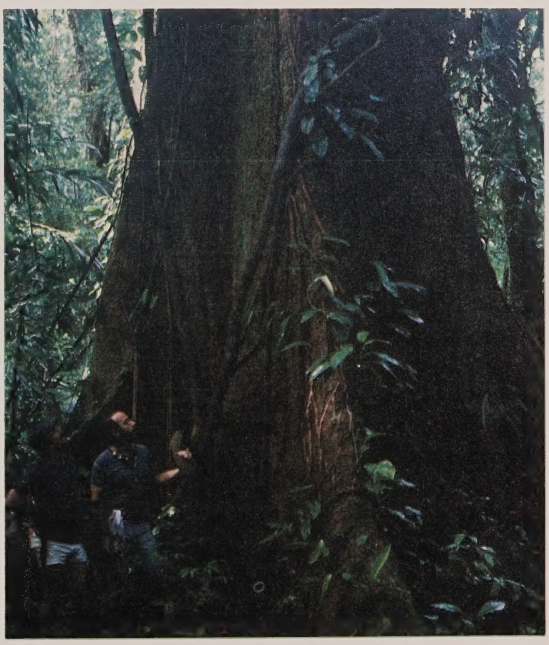
by Paul Colinvaux

It is moist and the air is soft. You breathe in the smell of a well-tended greenhouse, a comforting warm smell actually made by the fungi hidden underfoot, whose own life is essential to the life of the forest. However, from my own first walk in a Nigerian rain forest, I also remember the smell of crushed ginger. I saw the rhizomes of the ginger plants I trod on—they poked through the brown litter of the forest floor like iris rhizomes in a suburban garden.

There is gloom in the forest but also extraordinary space. The trunks of the great trees rise up straight and tall, set out like pillars along the nave of a great Gothic cathedral. Where I first walked there was almost no undergrowth but clear expanses between the trees through which one could have run a horse. Clouds floated between the branches, drifting patches of vapor that would no doubt come and go, but which I can still see 25 years later.

Very few western naturalists have walked, alone with their thoughts, in a true rain forest. Doing so can be one of the most sublime experiences of life, akin to looking into the eyes of an astonished wild fox at six feet. Or one might compare it to the first time a musically inclined person, starved of musical experience in youth, hears a Beethoven symphony. Your first moments in the forest will be with you as long as you have memory.

I remember walking very quietly, not just out of the ordinary caution of the naturalist, but because it was the same feeling I had experienced when I entered the great church at Canterbury while an organist was practicing. Moving quietly in the forest was like finding a pew in that deserted nave without adding an echo to the sound of the organ.



The trees branched at about a hundred feet. From there on up is the system of green layers and brown trusses that is the productive heart of the rain forest. Where there is a break in the canopy, light streams through against the rising mist in rays that you can see. I remember a small flight of white-crested birds coming soundlessly out of the forest gloom, banking their dove-like wings where the light rays played, then vanishing again into the gloom. Later I found a real dove, brightly impossibly green all over, except for its belly, which was sulfur yellow. Usually you could not see this dove, because the yellow was the light rays on mist and branch, and the green was the green around it. I

remember how an ugly dead growth on the branch of one tree suddenly opened in the middle and said "Gronk!" in a loud voice. It was a giant yellow casque hornbill (*Ceratogymna elata*). I remember, too, how the silence that made me place my feet so carefully was broken as frogs began to sing, then more frogs and more, until the song swept into the distance and stopped as suddenly as it had begun.

The trees in a rain forest all look alike from the ground, having bark that looks the same and leaves that look very similar. You cannot walk along naming the trees. If you find a local woodsman to help you, he will slash at the trunks with a machete, look at the colors revealed, and give you a name. It may not be the right name, and it will certainly be a vague one—a composite of what trees show the same color. There will really be a hundred tree species in the rain forest through which you walk, though some of them will be very rare. And this is one of the things that intrigues the scientific mind: why should there be so many species of trees in the rain forest? This question lies at the center of the evolutionary biologist's interests in the tropical rain forest.

We know that the rain forest has more species than any other ecosystem on earth. There are more kinds of birds, more insects, more amphibians, more reptiles, and more plants in unit area of rain forest than anywhere else. The place is short on hoofed mammals, though there are some, but the bats and monkeys more than make up for the deficiency. This great richness of species in the forest is one of the central facts of the distribution of life on earth. But we are far from reaching a consensus of why this is true.

One comforting explanation for the rain forests' great diversity of species was possible until recently, and it may still have some validity. It lay in the belief that tropical rain forests were ancient systems—that there were always wet tropics where life persisted in moist heat, with negligible seasons, for whole geologic epochs. In such a place, life might be protected enough so that it would be rare for a species to become extinct—an event that might usually be precipitated by some drastic happening, like a severe winter, which of course never occurs in the tropics. At the same time, new species would continue to evolve. We thought that the rain forests collected species and hardly lost any to extinction. Something like this probably happens in a very different part of the earth where there are many species, such as the floors of the deepest oceans. Ocean floors seem poor places in which to live; however, many kinds of small animals live there, apparently because life is safe (the "weather" never changes), and so the ocean muds collect species. But we can no longer explain the richness of the rain forests in this way, because we now know that they are not ancient at all.

The climate of the equator, no less than the climate of the north, changed in drastic ways during the last ice age. Enough work has been done in Africa to make it clear that both the plant geography and climate have changed repeatedly, making it appear as if the forest has been chased about by the weather. It is equally clear that the relationship between land, sea, and monsoon in the Far East has disturbed the tranquility of the rain forests there. Now we have reliable information showing that very large parts of the Amazon basin also held no forest for thousands of years in the recent geologic past. Whatever accounts for that spectacular array of species in a rain forest, it cannot be merely the result of life going on in a place where the climate is everlastingly the same.

There are still three ways for looking at this "problem" of numerous species: we can still imagine a low extinction rate, we can assume a high rate of speciation (the emergence of new species), or we can postulate smaller niches of tropical animals and plants, which allow the species to be more closely packed without ruinous competition. This last hypothesis is more interesting theoretically, though we are far from being certain how it can work. But we still need to think of all the tropical rain forest species as being adapted to equable climates. It seems we must get 'round the difficulty of the forests moving about in an ice age by expecting that there were always some places of equable climate where the rain forest species could live.

A patch of modern lowland rain forest is the creation of the last ten thousand years, *only*. The individual plants and animals have moved in, one at a time, slowly putting together that immensely complex entity we call the tropical rain forest. The forests we know have been built in these few millenia of equable climate, and they have been built from endless, subtle competitions between individual species. The whole forest entity is the necessary home of each form of life existing in it. The individual relationships between species, so slowly put together, do not seem able to suffer stress easily. Do something radical to the forest, and reverberating disaster may strike at a large proportion of its inhabitants. An appropriate demonstration of this phenomenon has been the cutting off of Barro Colorado Island, by flooding associated with construction of the Panama Canal. The island has a large tract of intact rain forest on it, but its species list has been steadily declining for 50 years. Apparently the simple fact of being cut off from

the main forest by water has been progressively fatal to many of its animals.

Rain forest species are often immensely sedentary. It has been shown in New Guinea, for instance, that some birds will not cross a water gap only 20 meters wide. Also it seems likely that animal collections on opposite banks of the Amazon River may be different for a similar reason. In this localness we seem to see specialization; and in the specialization we seem to see clues to the evolutionary mechanisms that make for so many species. The specializations that have left us so rich a heritage of variety are also responsible for making the rain forest species so immensely vulnerable.

Until a few years ago some ecologists argued that the rain forests might be inherently stable places. They thought this because of a widespread belief that ecosystems with many species were stable, whereas ecosystems with few species were not. The "few species" end of this argument was used by opponents of the Alaskan pipeline to delay construction for a year or two. But the whole postulate connecting species number with ecosystem stability is now realized to have been in error. The individuals in the rain forest are not so much braces of the system, but dominoes. Both mathematical and empirical arguments for this concept are now too strong to deny.

Yet the rain forests do have remarkable properties as whole ecosystems—properties requiring that very many of its species be allowed to survive. The best way to begin describing the rain forest ecosystem is to call it a permanently watered prairie raised 100 feet above the ground. The greenery is perched on stalks, a condition that has at least three far-reaching effects. Grazing animals must climb or fly, which gives the trees an advantage. Being evergreen, the microclimate in which most leaves, trunks, and roots must live is closely controlled. And the leaves can be arranged in layers and patterns that spread the light, letting the tree make use of large volumes of carbon dioxide in its quest for the carbon with which the forest is built. The result may well be the world's most productive ecosystem. Yet, curiously enough, this highly productive state may be maintained on the most impoverished soils.

Many lowland rain forests grow on soils utterly unsuited to agriculture. There are almost no plant nutrients in these soils, and the capacity of the soil minerals to retain nutrients is also very low. And yet they support the largest and most productive collection of plants on earth. Just like agricultural crops, rain forest plants need nutrients. If you analyze rain forest trees, you will find that they are well supplied with nutrients. In fact, all the nutrients of the forest are in the trees themselves—they literally are hoarded in the living ecosystem. When a tree dies, or when its parts are eaten and defecated by an animal, its nutrients fall to the ground; however, they are quickly regained as the trees pump them back from the soil minerals. Vital to this pumping process are the fungi, whose pervading presence contributes to that characteristic greenhouse smell of the forest. The smell of the fungi is the smell of life—the part of the system that circulates nutrients. When a rain forest is cleared, the smell is gone, and so are the nutrients that fungi and rootlets once conserved to make productive life possible.

Looking at the rain forest as a system—trapping energy high above the ground, fixing carbon in seried ranks of leaves in controlled incubators of climate, pumping water, and replenishing magazines of nutrients—you might think that it needs but a few kinds of trees and accompanying fungi to function. But this is not so. Each individual plant member of the forest has a personal relationship with animals. Some animals it must avoid, because it is a source of food. But other animals it may use both to defend it and to set its seeds. Some of the dilemmas of an individual tree can be understood by studying what one tree does to leave descendants.

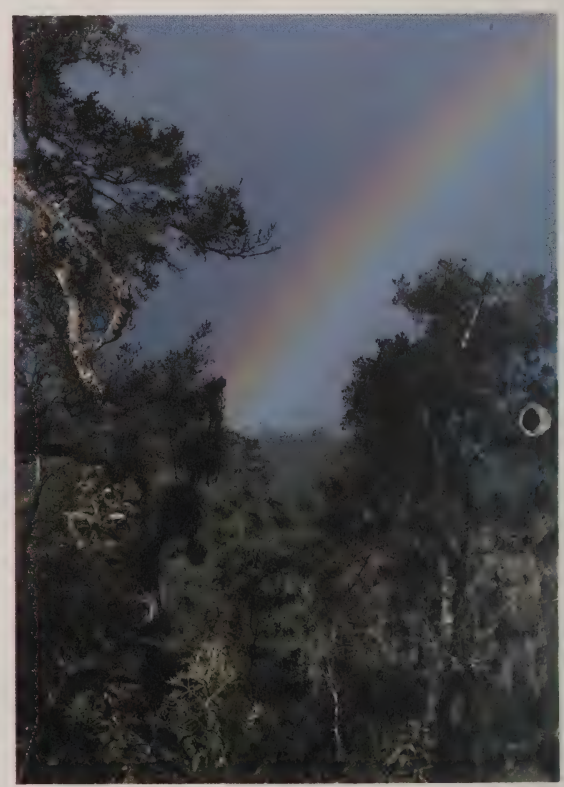
Seeds, by which a tree reproduces itself, are potentially very good to eat. Consequently, a tree may lace its seeds with poison to frustrate some animals—there are many deadly seeds in a rain forest. Yet this trick is not always enough. If trees develop poisonous seeds, it follows that there will be animals adapted to escape the poison. Therefore, some seeds that shower the ground will be eaten by some animals. These animals, both tiny and large, can use the parent tree as "a flag on a post," marking the array of delicious things beneath, and they congregate there. Some studies have shown that there is a 100 percent kill zone under a tree in which all its prospective offspring are eaten. What hope then is there for the tree? The hope lies in getting some seeds clear of the most desperate danger zone. For this purpose the typical rain forest tree uses a mammal or a bird to carry its seeds. If the young sapling can then be made to grow well away from the danger of its mother's skirts, the next generation can be assured.

If parent trees and their offspring cannot grow near each other, it follows that other tree species must fill the gap. Monoculture won't work in a rain forest. It is an entity that needs its many species, just as the many species need the forest. They tend to live or die together.

Spider monkey

From that first day in a Nigerian rain forest 25 years ago, another memory still fills my thoughts. It is my first sight of a gap in the canopy where a great tree had died. On the lighted patch of ground beneath, a small host of seedlings was climbing toward the light. Though stationary by the scale of human motion, the tableau was so evocative of a race for the sky that the mind's eye almost saw the saplings move. We now know that many species of seeds may germinate in one of those gaps and that the rushed climb for the light is indeed a competitive race. It may be that a seedling's simple gearing-up for this race is so specialized an enterprise that each slightly different gap in the forest canopy gives the advantage to a slightly different seedling. Here is another reason for the forest's great variety of trees.

When you have your first chance to wander in a rain forest (if you are in time, that is), spare a moment to think that the emotions you will surely feel are due in part to the mutual workings of that remarkable variety of species. The tropical rain forest is more than Gothic-cathedral space or vividness of green. It is a "storeroom" of the most remarkable diversity known on earth. This diversity is now in desperate peril.



Rainbow over tropical forest

As of 1976, the minimum destruction rate of the Earth's tropical rain forests was:

11 million hectares or 27 million acres per annum

30,137 hectares or 74,468.5 acres per day

1,255 hectares or 3,101 acres per hour

and, 20.5 hectares or 50 acres per minute.

The original area of rain forest was 15.92 million square kilometers (6.2 million square miles). In 1975, it had been reduced to 9.35 million square kilometers (3.6 million square miles), a 40 percent reduction in our tropical rain forests.

Figures acquired from the Food and Agriculture Organization of the United Nations, via World Wildlife Fund, Washington, D.C.

The tropical rain forests are being cut away at a rate that will quite likely push them into oblivion a single human generation. *Exact* figures are —as always in these things—difficult to verify, but any reasonable estimate puts the denudation of rain forests at rates of several percent per annum. (See accompanying box.) You may wonder if any forests so vast as those seen from a cruise ship on the Amazon can really be cleared away; but remember that a forest almost as grand, stretching from the Appalachian Mountains to the prairies of the American west in the early nineteenth century, was thrust aside purely by human muscles swinging axes. More potent energy than muscle is now being loosed on the rain forests.

The reasons for destroying rain forests are very strong. There is money to be made in selling bits of trees—fortunes that can be piled up with an extravagance of waste just as fortunes were built in eliminating the American buffalo herds in a scant 10 years. Further fortunes are made by gleaning exorbitantly high rents from landless farmers for the stump-studded remnants. There is political power in the cry, "Rain forest land for the people!" And there is bureaucratic prestige in using the forest biomass for making alcohol or fueling power-stations. In short, the rain forests can be mined for immediate profit in all the ways that people usually measure profit.

Fortune hunters, and those seeking instant political favor, will see no reason for leaving the forests alone. Why bother to tell these people that a red wasteland of mud will be bequeathed to posterity when they can reply, "So what! The forest isn't good for anything anyway." The fortune hunters and political power seekers cannot be bettered with simple economic arguments, for to them the rain forest is a free lunch to be picked up while the picking is good. Yet, fortunately, these are not the only people who rule the world; so there is still hope for the forests.

Some of the larger rain forests now come under the control of nation states, who have growing pride in their futures and their place in the world. The richest of forests, like the highest of mountains, are precious to proud people simply because they are there. Ecological science has at last reached the point where we can say what should be done if the rain forest species are to survive: set aside some very large tracts and leave them utterly alone. Do not work piecemeal; do not try the zoo approach of incarcerating species; do not try to manage an ecosystem that we do not yet fully understand. Choose a few big bits of the best rain forests and leave them alone. This is a recipe that national pride can follow. I suggest that national pride may well be the savior of that essential minimum of rain forest systems—systems that are large enough to be self-sustaining and large enough to contain the maximum amount of plant and animal species. In this way, those remnant forests may one day have the ability to expand and to enrich the lives of our far descendants.

Paul Colinvaux is professor of zoology at Ohio State University, where his lectures and classes have earned him every distinguished teacher award of the University. His scientific studies have taken him from the rain forests of Nigeria to the Galapagos Islands (for research covering a period of 10 years) to the Alaskan Arctic. Dr. Colinvaux is the author of *Why Big Fierce Animals Are Rare,* an ecologist's perspective.

SMALL STEPS, NEW PATHS

A Review of Conservancy Efforts South of the Border

by R. Michael Wright
Director, International Program

Our growing impact on the world around us is reflected in stark statistics: in the 19th Century 75 bird species and 27 mammal species became extinct. So far the 20th Century has witnessed the disappearance of 53 birds and 68 mammals. Today 345 birds, 200 mammals, 80 species of amphibians and reptiles, and between 20,000 and 25,000 plant species are known to be threatened with extinction.

Tropical rain forests—habitat for an estimated *1 million species* of plants and animals in the Amazon alone—are in serious jeopardy worldwide. In many areas the mythical "green hell" is being converted into a sterile red desert, thereby undermining food potential, altering climate, destroying a vast resource to meet future human needs in agriculture, medicine and pharmaceuticals, and industry.

In the Caribbean, massive landscape alteration, both past and present, has already eliminated much of the region's natural heritage. A study financed by World Wildlife Fund has shown that the survival of *all* the distinct Caribbean species of spectacular Amazon parrots is in serious doubt. Even tree species are passing into oblivion. Only a single specimen of the mastic tree (*Mastichodendron sloaneanum*), once a common and valuable source of timber throughout the West Indies, is believed to survive on the island of Antigua.

The pressures in Central and South America are as relentless as those in the Caribbean. Two-thirds of the once vast Central American forest have already been lost. Hundreds of species of monkeys, birds, fish, and cats inhabiting the forest are nudged ever closer to extinction.

Some areas are lost in response to legitimate aspirations for human survival, but the majority are sacrificed needlessly through ill-planned development or exploitation. Faced with immediate needs, local governments feel they must place great value on any benefit, however short-term, and heavily discount or totally ignore future costs of their actions. The governments are caught in a dilemma, succinctly described by the Brazilian Amaro Theodoro Damasceno as "destroying gold for the production of silver." Many of these people are extremely proud of their own nations' unique character, but they often lack the financial resources, technical knowledge, and institutional structure necessary for rational protection of their countries' natural resources.

Facing this challenge, in late 1974 The Nature Conservancy determined to experiment with a program to assist natural area preservation in other nations using the Conservancy's effective domestic techniques where appropriate. To obtain the maximum impact from our resources, the program was focused on the Western Hemisphere—primarily the Caribbean and Central America—and was undertaken in cooperation with and support from the leading international conservation organization, World Wildlife Fund. Additional support was provided by the Rockefeller Foundation Fellowship Program in Environmental Affairs and Exxon Corporation.

The Caribbean

The first project of the Conservancy's International Program lies on the West Indian island of Dominica. The Archbold Preserve is dominated by trees rising to 100 feet from broad buttresses. Fifty feet above the forest floor the branches are draped in cable-like lianas (vines) and epiphytes, or air plants. The most common trees of the preserve are the giant red-buttressed chataignier and the unbuttressed pillar-like gommier, thriving amid a scattering of other species, such as the aerial prop-rooted mangle blanc. In contrast to North American forests, which are dominated by only a few species, the diverse forest of Dominica contains as many as 60 different tree species within a

10-acre plot. The luxuriant vegetation recently caused author Alec Waugh in *A Family of Islands* to exclaim, "I had not believed that anything could be so green."

Dominica's wildlife, generally nocturnal and shy, reflects the isolated island environment. Besides two endangered parrots, the blue-headed hummingbird, and two species each of snakes, lizards, and bats are endemic to Dominica. One other island shares the *crapaud* (a large wood frog known locally as "mountain chicken") with Dominica. The island's 135 species of native birds include the trembler (*Cincolcerthis ruficauda*), a thrush whose courtship and territorial display involves a rapid, quivering movement.

Dominica's precipitous peaks, bathed in over 300 inches of rain per year, plunge steeply to cliffs, black sand, and cobbled beaches. Torrential rivers, sparkling streams and waterfalls, deep valleys, tall trees, and lush vegetation characterize the recently independent country. The island's undisturbed flora is the last large expanse remaining in the Lesser Antilles.

Dominica's concern for nature is symbolized by the use of a Sisserou or imperial parrot—one of the two endangered parrots found only on the island—on its new national flag. Even more tangible evidence is the 16,000-acre Trois Pitons National Park adjacent to the Archbold Preserve, which covers 10 percent of the island's land area. The park represents an extraordinary commitment by the Dominican government and a testament to the leadership and perseverance of Chief Forest Officer, Chris Maximea. The park encompasses four forest types, mountains ranging from 3,683 to 4,400 feet, and three strikingly different lakes—including one of the world's largest boiling lakes. The barren Valley of Desolation contains sulfur springs, steam-belching fumaroles, and streams of black, white, red, gray, and orange water.

The 950 acres of pristine rain forest donated to the Conservancy in 1974 by Mr. John D. Archbold of Virginia are presently leased to Dominica as part of its park and education programs. It is expected that it will be formally transferred to the Dominican government in the near future.

With its towering cathedral cactus and flocks of orange-headed parakeets, the Slagbaai Plantation on the Dutch island of Bonaire stands in stark contrast to the lush rain forest of Dominica. Seemingly even more out of place in this desert environment are Bonaire's 10,000 flamingoes, which feed in Gotomeer Lake on the Plantation. Slagbaai, an area of approximately 4,200 acres, is located on the northwest coast of the island of Bonaire, 60 miles north of Venezuela. The plantation ranges from sea level, including some of the most beautiful and accessible fringe reefs in the Antilles, to the summit of Mount Brandaris, the highest point on the island at 784 feet. The shoreline of the tract includes white sandy beaches, 10- to 40-foot limestone cliffs jutting into the cloudless azure sky, and four large landlocked bays.

One of the Caribbean region's three desert islands, Bonaire has a relatively large number of plant species—340. One unusual species, *Agave vivipara*, will put forth, after some seven years of effort, its first and only flower stalk. The stalk will then grow at a rate of almost a foot a day, reaching a height of up to 20 feet before apparently succumbing to the effort and dying.

The preserve includes four separate plant communities, while the island provides one of the three remaining nesting areas in the Caribbean for the roseate flamingo. Slagbaai also provides essential feeding area and refuge for Bonaire's endangered species of Amazon parrot. Field guides list an additional 111 bird species for Bonaire.

After an extraordinary two-year effort by Dr. Ingvar Kristensen, the Netherlands Antilles National Parks Foundation was able to acquire this pristine area in 1978. Now known as Slagbaai National Park, the land is bordered on the north by National Park Washington (5,760 acres) and on the south by Plantation Brasiel, forming a total protected area of 12,000 acres—an astonishing 17 percent of the island.

As has occurred with several international projects, the Netherlands Antilles National Parks Foundation's total resources were expended on acquisition of the land. Funds are still needed for a system of roads and trails, fencing, housing for guards, and other protection measures. The Conservancy's International Program has obtained half of the $20,000 it is seeking to assist the Parks Foundation with immediate stewardship needs on Slagbaai.

Formerly a part of the Mayan Empire, Belize, on the mainland of Central America, is considered by many to be an independent Caribbean nation. This claim is countered by Guatemala, which considers Belize its own. Discovered by the Spanish and colonized in the 1600's as a result of a British shipwreck, Belize is a still sparsely populated country of rain forest, including 200 miles of Caribbean coast with mangrove, tidal swamp, beach or rocky shore, and over 175 islands.

No matter how the 156-year-old jurisdictional dispute is resolved, Belize has large intact ecosystems, including the longest barrier reef in the Western Hemisphere, which must be preserved. An extremely effective regional organization, the

Orchid, Monteverde

Flamingos, Slagbaai

Emerald Pool, Dominica

Golden toad, Monteverde

Wildland and Watershed Unit of CATIE (Centro Agronomico Tropical de Investigacion y Ensensanza) in Costa Rica, joined with local, private, and government agencies to create Half Moon Caye National Monument. The 40 acres of coconut palm and mangrove is part of Lighthouse Reef (one of the few true coral atolls in the Caribbean and Atlantic) and provides nesting habitat for the green turtle, some 3,500 white-phased, red-footed boobies, and a sizable number of magnificent frigatebirds.

CATIE's fund raising goal for the project includes not only matching funds for land acquisition, but for equipment and on-site training of wardens. The Conservancy is the first of a broad range of internationally-oriented conservation

the
General Fund
needs
your
support

the General Fund

The Nature Conservancy is a national conservation organization whose resources are entirely devoted to the preservation of land.

The Conservancy's General Fund helps provide the resources necessary to defray the organization's annual operating expenses. It is dependent upon public support.

Only with your help can the Conservancy meet the increasingly complex and urgent demands of natural area conservation.

Please give to the General Fund. Your donation can make a difference in the future of our environment.

THE NATURE CONSERVANCY
23rd ANNUAL MEETING AND CONFERENCE

CINCINNATI, OHIO
SEPTEMBER 19-23, 1979

Official Notice

Notice is hereby given to the members of The Nature Conservancy, pursuant to Article VII, Section 2 of the Bylaws of The Nature Conservancy, 1976 Revision, that a membership meeting will be held at the Netherland Hilton Hotel, Cincinnati, Ohio, at 9:30 AM on September 21, 1979, for the purpose of receiving reports, electing Officers and Governors of The Nature Conservancy for the ensuing year, and acting on such other business that may come before the meeting.

Please note the enclosed official ballot. It should be signed and returned as described therein.

Patrick F. Noonan, President

TENTATIVE SCHEDULE

Wednesday, September 19

7:45 am — Pre-Conference Field Trip
LILLEY CORNETT WOODS
Return — Thursday, September 20 — 6 pm

Thursday, September 20

8:00 a.m.- 7:00 p.m.
Registration, Netherlands Hilton Hotel

9:00 am-10:20 am
Opening Board of Governors Committee Meetings
A. Development
B. Science/Land Stewardship

10:20 am-10:40 am
Coffee Break

10:40 am-12 noon
Open Board of Governors Committee Meetings
A. Governmental Relations
B. Volunteer Activities
C. Finance & Investment

12 noon- 1:30 pm
Buffet Luncheon

1:30 pm- 3:15 pm
The Project Review Committee Meeting
Planning Committee Meeting
WORKSHOPS
A. Why Protect Rivers
B. Research on Natural Areas: Appropriate types, development of program, and sources of financial support
C. Building a Strong Chapter

3:30 pm- 3:40 pm
Coffee Break

3:40 pm- 4:30 pm
Orientation Session — "Cincinnati on the Arch"

Evening Activities

5:00 pm- 5:30 pm
Walk on the city skywalk system to the Southern Ohio Bank

5:30 pm- 6:15 pm
Reception at the Southern Ohio Bank

7:00 pm- 9:00 pm
OPENING RECEPTION — Germanfest at the Cincinnati Natural History Museum

Friday, September 21

8:00 am- 6:00 pm
Registration

9:00 am- 9:30 am
President's "Year in Review"

9:30 am-10:30 am
ANNUAL MEETING OF THE NATURE CONSERVANCY

10:30 am-10:45 am
Coffee Break

10:45 am-12:15 pm
WORKSHOPS
A. How to Protect Rivers: The Little Miami, A Case Study
B. Efforts of Three State Governments to Preserve Natural Diversity
C. Alaska Lands: A Balanced Approach to Their Use
D. Prairie Preservation and Restoration in the Prairie Peninsula

12:15 pm- 1:30 pm
Buffet Luncheon

1:30 pm- 5:00 pm
FIELD TRIPS
A. Little Miami Canoe Trip
B. Boone Cliffs
C. Cincinnati Nature Center
D. Northside Woods and Warren Wells
E. Art and the River
F. Red Bird Hollow and Kroger Hills
G. Mt. Echo Park and Glenway Woods
H. Withrow Nature Preserve
I. Stoned in Cincinnati

Evening Activities*

6:30 pm- 9:30 pm
Riverboat trip and buffet dinner on the Chaperone
*Those wishing to attend Rosh Hashanah services should make arrangements through your synagogue.

Saturday, September 22

7:15 am- 6:00 pm
Information Desk

7:45 am- 5:30 pm
ALL DAY FIELD TRIPS
A. Kroger Hills, Red Bird Hollow, Cincinnati Nature Center
B. Cedar Bog, Glen Helen, Clifton Gorge
C. Edge of Appalachia
D. Boone County
E. Bluegrass of Kentucky, Cultural and Historical
F. Experience Cincinnati
G. Little Miami Canoe Trip

Evening Activities

6:30 pm- 7:30 pm
Regional Cocktail Receptions

7:30 pm-10:30 pm
AWARDS BANQUET
Speaker: Neil Armstrong

Sunday, September 23

Attendee Departures

Sunday, September 23

7:45 am — POST-CONFERENCE FIELD TRIPS
A. Edge of Appalachia
B. Pilot Knob
Return Monday, September 24 — 6:00 pm

Official Ballot

Name (please print) _____

Address _____

_____

Signed _____

A valid ballot can be executed only by a member in good standing. To cast your vote for the slate of Officers and Governors proposed by the Nominating Committee and for the Bylaws revisions, return your signed ballot to The Nature Conservancy. To allow sufficient time for processing, ballots should be received by September 7, 1979.

Proposed Bylaws Revisions

---------- = word deleted
_____ = word added

Article III
Membership

Section 1. **ELIGIBILITY.** Any responsible individual or organization approving of the objectives of the Conservancy shall be eligible for membership.

Section 2. **CLASSES.** Members shall be of the following classes:

a) **HONORARY.** Individual leaders in the field of nature conservation ~~nominated~~ elected by the Board of Governors ~~and designated by vote of the membership at a regular meeting.~~

b) **LIFE.** Individuals making a single contribution for the general purpose of the Conservancy in such ~~classes~~ categories and in such amounts as the Board of Governors may from time to time establish, who are elected by the Board.

c) **ANNUAL.** Individuals eighteen years or more of age or organizations, contributing ten dollars or more ~~per year,~~ or individuals under eighteen years of age contributing five dollars or more, ~~for the general purposes of~~ to the Conservancy, in such ~~classes~~ categories as the Board of Governors may from time to time establish, who are elected by the Board.

d) **~~SUPPORTERS.~~** ~~Individuals or organizations making a contribution of land or money to The Nature Conservancy for any purpose, but not as a dues-paying member, shall be designated a "supporter," in accordance with standards established by the Board of Governors.~~

e) **~~COOPERATING.~~** ~~Individuals or organizations exchanging information or otherwise cooperating with the Conservancy in such a manner as to warrant designation by the Board of Governors.~~

f) **~~STUDENT.~~** ~~Any student at a recognized educational institution contributing five dollars or more for the general purposes of the Conservancy.~~

Section 3. **DURATION.** Honorary and life members shall hold membership for life. Annual members shall hold membership for periods of one year, in accordance with procedures to be established by the Board of Governors. ~~Project and cooperating members shall hold membership for such periods of not less than one year as may be designated by the Board of Governors.~~

Section 4. **POWER TO GOVERN.** Honorary, annual, and life members, who are eighteen years or more of age, shall be eligible to vote, to hold office, and to participate in determining matters of policy, provided that member organizations shall not be eligible to hold office.

All references to "member," "membership," and the like in Articles IV, VII, VIII, X, XI relate solely to members eligible under this section.

Section 5. **OTHER RIGHTS.** Members shall be informed of activities and progress of the Conservancy through annual or more frequent reports. They may attend meetings of the Board of Governors as observers. They may inspect the records of the Conservancy. Members should support the Conservancy and participate in its efforts in every way possible.

Section 6. **MEMBER ORGANIZATIONS.** Each member organization shall be represented in matters affecting the Conservancy by a single representative, who shall be the secretary of the member organization unless another representative is specifically designated in writing. Annual membership organizations alone are entitled to vote and each such organization shall have only one vote.

Proposed by the Nominating Committee for Election to the Board of Governors

NOMINATED AS OFFICERS:

Frank D. Boren, California, current member, nominated as chairman. Attorney; a trustee of the Conservancy's Southern California Chapter; member of Sierra Club; partner in law firm Paul, Hastings, Janofsky, and Walker.

Mason Walsh, Jr., Pennsylvania, current vice-chairman, is renominated. Vice president and general counsel, Richard K. Mellon and Sons. Trustee of several charitable trusts and foundations and of the Western Pennsylvania Conservancy.

G. Jon Roush, Montana, current member, nominated as vice-chairman. Former executive vice-president of the Conservancy; member of the Rockefeller Brothers Environmental Task Force; author of several publications in the fields of conservation, art, and literature.

John B. Oakes, New York, current member, nominated as vice-chairman. Former editor of the editorial page, ***The New York Times;*** author of ***The Edge of Freedom;*** former member of Board of Directors, Sierra Club; former trustee, Natural Resources Defense Council.

Robert B. Anderson, New Mexico, current secretary, is renominated. Chairman of the New Mexico Chapter of the Conservancy; president of Lincoln County Land and Cattle Company; director of Security National Bank of Roswell; active in New Mexico conservation and historic preservation.

Charles C. Haffner III, Illinois, current treasurer, is renominated. Former chairman and treasurer of the Illinois Chapter of The Nature Conservancy; vice president, treasurer, and director of R.R. Donnelley & Sons Co.; trustee of Morton Arboretum.

NOMINATED AS MEMBERS OF THE BOARD

John E. Andrus III, Minnesota, current chairman. Former president of Deep Draw Corporation; trustee of the Minneapolis Society of Fine Arts; trustee of the Conservancy's Minnesota Chapter.*

Wallace C. Dayton, Minnesota, former member and chairman of the Conservancy's Board of Governors. Chairman of the Minnesota Chapter of The Nature Conservancy; officer of the Dayton-Hudson Corporation.

Dr. Jerry F. Franklin, Oregon, forester and ecologist, former director of the Ecosystem Analysis Program, National Science Foundation; chief ecologist and project leader, Pacific Northwest Forest and Range Experimental Station, U.S. Forest Service.

The Honorable Kaneaster Hodges, Jr., Arkansas, attorney; former chairman, Arkansas Natural Heritage Commission; former members, Arkansas Game & Fish Commission; appointed to the U.S. Senate in 1977 to fill vacancy caused by death of John McClellan.

Donal O'Brien, Connecticut, lawyer. Trustee, National Audubon Society; counsel for Rockefeller Brothers Fund and Rockefeller Family Fund.

The Honorable Nathaniel P. Reed, Florida, current vice-chairman. Former Assistant Secretary of the Interior for Fish & Wildlife and Parks; chairman of the Florida Coastal Zone Management Committee; trustee of National Audubon Society.*

Mrs. Peggy Sharpe, Rhode Island. Director of the Rhode Island Conservation Law Foundation; vice chairman, Zone II of the Garden Club of America; chairman of the Citizens Advisory Board of the Rhode Island Solid Waste Management Corporation.

David Stansbery, Ohio, professor of Zoology at Ohio State University; member of the American Rivers Conservation Council; chairman of IUCN's Freshwater Mollusk Group; trustee of the Conservancy's Ohio Chapter.

Hubert W. Vogelmann, Vermont, chairman of the Conservancy's Vermont Chapter; professor of Botany and chairman of the Botany Department at the University of Vermont; recipient of 1979 American Motors Conservation Award.*

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*Current member renominated

Here is a list of my friends who would appreciate hearing of your efforts.

Name _____ (please print)
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City _____ State _____ Zip _____

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Address _____
City _____ State _____ Zip _____

Name _____ (please print)
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City _____ State _____ Zip _____

Enclosed is my contribution of $ _____ to the General Fund of The Nature Conservancy.

Name _____

Address _____

City _____ State _____ Zip _____

Contributions are tax-deductible. Please make checks payable to The Nature Conservancy. Your cancelled check is your receipt.

What we have saved and what we will save in the next few years will be all that will remain to be passed on to future generations.
There will never be another chance.

Your stamp on this envelope is an additional contribution to the Conservancy.

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Caiman, Corcovado

Sisserou parrot, Dominica

Corcovado coast

agencies from which CATIE has received support for what will be the beginning—and hopefully a model—of an extensive system of parks and protected areas in Belize.

Central America

Ironically, dispute over jurisdiction of land was the catalyst for the most recent Conservancy-assisted project in Central America. In 1977, preceding the signing of the Panama Canal Treaties, the future of the rain forests within the Canal Zone became an issue of conservation concern.

Despite one of mankind's greatest engineering feats, a significant portion of the rain forest along the Canal remains as it was when the French first sought unsuccessfully to subdue it in the 1880's. The jungle that survived the creation of the Canal lies about an hour's drive from downtown Panama City and is known as the "Pipeline Road." One of the most thoroughly studied rain forests, "Pipeline Road" supports over 285 species of birds, 650 species of vertebrate animals—including 17 endangered species—and more than 1,500 different plant species. This remarkable jungle and others nearby, such as the Smithsonian Tropical Research Institute's famous reserve at Barro Colorado Island, which is adjacent to "Pipeline Road," form a bridge between North and South America. Within this "bridge," the floras and faunas of two continents meet and mix. Consequently, there are more plant and animal species, especially birds, in Panama than in all the U.S. and Canada. Indeed, most of the birds inhabiting North America in the summer are migrants from the tropics, merely using the north for nesting. One indication of the value of this area is that during Treaty negotiations, both the U.S. and Panamanian governments agreed to

designate Barro Colorado Island as a Nature Monument. But what did the future hold for the other nearby rain forests?

Panama and the U.S. Agency for International Development (AID) have recognized the intimate relationship between the imperiled rain forests and Panama's water supply—that is, one does not exist without the other. Not only is the watershed critical for the economic operation of the Panama Canal itself, but it provides hydroelectric power and water for nearby population centers—centers that by the year 2000 will contain some 1.7 million people. Consequently, Panama and AID, with cooperation from private conservationists including the Conservancy, have initiated a major project to encourage ecologically sustainable and sensitive development around the Canal to protect this vital watershed.

Another most far-sighted decision was made on March 29, 1979. Panamanian President Aristides Royo declared that as of October 1, 1979, the forest area known as the "Pipeline Road" will become a new national park, used primarily for scientific investigation, and educational and recreational purposes. The Conservancy's International Program will assist in establishing the new park, which will encompass almost 50,000 acres.

While creation of the new Panamanian park was a result of government action, to the north in Costa Rica, the Monteverde Cloud Forest Preserve stands as an example of what is possible through private efforts. The 6,000-acre preserve straddles the Continental Divide in the Tilaran Mountains of northwestern Costa Rica and contains six different ecological communities in close proximity. As you climb the preserve trail, the relatively dry, protected lower forest gives way to the wind sculptured, moisture-saturated cloud forests of the mountaintop. The gnarled oaks drip not only with water, but also with sinuous vines and epiphytes (air plants), such as orchids and bromeliads. As many as 100 species of epiphytic plants, from lichens and mosses to strangler figs, may exist on a single upper canopy tree. Over 2,000 plant species are native to the area, while more than 320 birds and 100 mammal species have been observed. Some of the more outstanding and fascinating birds are the great green macaw; the black guan—a large lowland forest bird that resembles a turkey; one of the most beautiful birds of tropical America, the resplendent quetzal; the three-wattled bellbird, whose booming "glong" is heard throughout the forest; and the bare-necked umbrella bird. Four endangered cats find refuge in Monteverde—jaguar, ocelot, margay, and puma. Baird's tapir, the largest neotropical land mammal, is found in the

Among Corcovado's wildlife are the frigate-bird, the Pacific ridley turtle, and the margay.

preserve, along with the endangered golden toad, or Monteverde toad, which occurs exclusively in the area.

Land acquisition for the Monteverde Preserve was initiated in 1972. Since then, the cloud forest sanctuary has been pieced together painstakingly, bit by bit. As the preserve has grown, it has attracted small grants from virtually every internationally oriented private conservation organization (and numerous concerned individuals) in the U.S. and elsewhere. For example, the Conservancy's International Program recently raised $12,000 to provide the key facility needed for long-term research projects currently underway in the preserve. Monteverde is sponsored and title is held by the Tropical Science Center, a non-profit Costa Rican organization.

Containing an even greater diversity of plants and animals than the cloud forests, the lowland tropical rain forests are threatened by a destructive force that is more persistent, pervasive, and immediate than anywhere else in Central America. (See box on page 13). The 89-000-acre Corcovado National Park on the Osa Peninsula of Costa Rica is the largest of such tropical rain forests now protected in Central America. With its tenuous connection to the mainland, the peninsula has evolved as a virtual island of wet tropical systems on the dry Pacific coast.

In 1976, The Nature Conservancy, together with World Wildlife Fund and Rare Animal Relief

Effort, raised $150,000 to assist the Costa Rican government in establishing the Corcovado National Park. Under the leadership of Mario Boza and Alvaro Ugalde, respectively the past and present Directors of the Costa Rican National Park Service, Costa Rica's system of parks and preserved lands has grown to encompass 26 areas—one of the finest conservation efforts anywhere in the world.

Among the 287 bird species listed for the Osa Peninsula are five found only in this region—a wren, a tanager, an antbird, a toucan, and a trogan. The Corcovado contains numerous varieties of hawks, falcons, and hummingbirds—plus the common motmot—and gaudy toucans with their oversized bills. Raucous parrots are heard throughout the forest. The swamps provide habitat for ibis, jabiru storks, cormorants, roseate spoonbills, and boat-billed herons; while the coast harbors magnificent frigate-birds, boobies, pelicans, and an occasional osprey. In addition, the Park shelters populations of endangered harpy eagles and flocks of striking scarlet macaws, a species that is rapidly disappearing elsewhere in the hemisphere.

The tropical forest's major consumers are the ever-present leaf-cutter ants, foraging brigades of carnivorous army ants, and other varieties. All sustain such highly specialized species as the Corcovado's endangered giant anteater. Threatened American crocodiles and caimans share the marshes and lagoons with some of the Osa Peninsula's 42 species of frogs and 19 species of lizards. The *fer de lance,* the coral snake, and many nonpoisonous snake species—including the boa constrictor—populate the various forest systems. Endangered hawksbill and Pacific green turtles share the nesting beaches with pelagic leatherbacks and Pacific ridleys. Sperm whales have been sighted in the offshore waters.

All of Corcovado's six species of cats—jaguar, ocelot, puma, margay, jaguarundi, and tiger cat—are endangered elsewhere in Central America. However, in the Park they find ample food among the bands of collared and white-lipped peccaries, the ungainly browsing tapir, and the small rodents and reptiles. Over 30 species of bats—including at least one vampire bat—fill niches in the rain forest, along with coatimundis, armadillos, and masked tayras (one of the largest of the weasels). Several of Corcovado's mammals sport prehensile tails: anteaters, kinkajous, a porcupine, and—of course—monkeys. In contrast, two sloths have evolved a sedentary arboreal lifestyle.

The biotic diversity of Corcovado is due in part to its 13 distinct ecosystems. But the park's diversity is vertical as well as horizontal. In the upper basin forest, shallowly rooted trees, draped in vines, rise unbranched to 115 feet and reach 213 feet with plant buttresses over 7 feet tall. The forest has four distinct vertical layers, each differing dramatically from the other, having its own separate species and contrasting microclimates. The gallery forest further down is dominated by great espavel trees, which have cylindrical trunks up to 10 feet in diameter. In adapting to a waterlogged existence, some plants rise from stilts, others float, and many abandon the ground altogether and—as epiphytes—move into trees.

The Corcovado Park's bewildering variety of life is a deception, for the apparent fertility results not from the richness of the soils but from a climate unmarked by warm and cold seasons. Past attempts to squeeze long-term economic profit from the rain forests have proven futile, yet man continues. Robert Allen of the International Union for the Conservation of Nature and Natural Resources (IUCN) has observed, "In a fragment of time, we can reduce the richest, oldest plant community in the world to a sterile mockery of its former self. . . . To be a child of our times is to be able to say, 'I will outlive the jungle.' "

A Londoner is reported to have described wilderness as ". . . a large damp place where wild birds fly about—uncooked." By this or any other definition, the Conservancy's latest cooperative project with our Canadian neighbors is an extraordinary wilderness.

A 25-mile long spit of sand thrusting out into the middle of Lake Erie, Long Point has engendered superlatives from its beginning. The 4,000-year-old Point is situated within 100 miles of millions of people and yet represents a picture of the continent as it was before human settlement.

After two previous offers to sell the area drew no bidders, the government of the Province of Canada finally sold almost 15,000 acres of the Point to a group of businessmen/hunters who were chartered on August 15, 1866, as the Long Point Company. By that time the area had acquired considerable notoriety, often due to unsavory Americans crossing the lake. Illegal prize-fights were staged on the Point; questionable establishments were opened; and ships were lured to destruction on the shifting sands by wreckers who then plundered the vessels. Indeed, during the 19th Century, the Point had the unenviable reputation of being the worst spot for shipwrecks in the world.

Although Long Point was acquired some six years before the creation of the world's first national park, Yellowstone, the company immediately sought to establish conservation practices on the Point. At the shareholders' first meeting, close seasons were established, licenses were required, and trapping regulations were created. Also, a long and, at times, violent struggle began between the company and poachers. Deer, which had completely disappeared, were reintroduced; previously depleted muskrat, mink, and otter began to thrive. By 1872 it was reported that ". . . Long Point is

Long Point, Canada

by R. Michael Wright
Director, International Program

the only place in Ontario capable of being effectively protected for the preservation of game and fur-bearing animals. . . ."

Shareholders in the Long Point Company have never exceeded 20 members; but over the years European royalty and several governors general of Canada have hunted at the Point. At various periods, the company's headkeeper and decoy makers, as well as the present secretary-treasurer, have been third generation employees of the company. A strong sense of tradition pervades the modest company facilities, which are simply a number of cottages connected by walkways, sitting on stilts in the midst of thousands of acres of marsh.

At least 45 species of animals and plants, which are rare, threatened, or endangered elsewhere in Canada, exist at Long Point. Of the area's six species of turtles, the spotted turtle is endangered and the eastern spiny softshell is threatened. Four of the snakes are threatened, one is endangered; and Blanchard's cricket frog—regarded as Canada's most endangered frog—is found on the Point.

Long Point includes approximately 9,500 acres of marsh and 6,500 acres of upland, with a succession of eight unique floral communities. Thirty-two vascular plants, listed as rare in Ontario, have been recorded on the Point, which for several species is the only known location in the province.

However, it is the bird life, particularly waterfowl, for which Long Point is best known. The pristine sandspit provides one of the best places in Canada to observe the spring and fall bird migrations. In the spring, it is the most important staging area (assembling site) for whistling swans; while during both the spring and fall, the Point may be the single most significant assembling area in North America for red-head and canvasback

About one-third of all the canvasbacks wintering in eastern North America gather at Long Point. Left, a canvasback drake.

ducks. At any one time, as many as 70 to 80 thousand canvasbacks and 80 to 140 thousand redheads may gather at Long Point—about *one-third* of all the red-heads and canvasbacks wintering in eastern North America. Since the status of both these species has been precarious, the season has been periodically closed during the last 20 years—a condition that can be difficult to appreciate when the skies above the Point are blackened by ducks. The Point's marshes are also of critical importance—second only to those of Lake St. Clair—for assembling mallards, black ducks, and other dabbling ducks, as well as for an increasing number of Canada geese.

It was in part the Point's concentration of songbirds that led to the creation of the first permanent observatory on this continent for the study of birds in the field. Birds banded at the Long Point Observatory have been recovered from as far away as Alaska, Guatemala, and Brazil.

Long Point's 20 miles of beaches support many nesting shorebirds, as well as several species of terns and thousands of gulls. The shifting sands are also the only breeding site in Canada for the piping plover, which is in critical danger of becoming extinct as a nesting species in Ontario. Six raptors—red-tailed hawk, bald eagle, marsh hawk, great horned owl, short-eared owl, and saw-whet owl—are known to nest on the Point, while rough-legged and marsh hawks and snowy and great horned owls winter there.

Preserving Long Point in its natural state represents an unprecedented example of public and private international cooperation. As a result of three years of effort and the generosity of Long Point Company members, the common goal of permanently protecting the unique sandspit has been reached. In December 1977, the Canadian members of the Company donated 2,617 acres of the Point to the Canadian Wildlife Service, along with a smaller gift to The Nature Conservancy of Canada (an independent but similar-minded organization). In a separate transaction, the U.S. Nature Conservancy received over two million dollars

worth of Company shares, which have since been converted to 5,648 acres of the Point. Continuing to seek a solution to assure that the future integrity of Long Point would not be threatened by the mixed ownership, this past spring the Conservancy gave 5,546 acres to the Canadian Wildlife Service. Together with the earlier gift, this area now forms part of the largest natural wildlife area in Canada. The land was donated under a carefully drawn set of restrictions. The Company's continued exemplary management of the 7,840-acre main marsh is mutually desirable, but the members have voluntarily bound the land to an extremely stringent set of restrictive covenants (similar to a conservation easement) and granted a preferential right to purchase to the U.S. Conservancy and the Canadian Wildlife Service.

The solution for Long Point has been complex and its success a testament to the possibilities of cooperation between public and private organizations and individuals from two nations. Yet Long Point is a dynamic system growing and shifting in response to changes in weather, wind, and currents —recently the unique sandspit has been lengthening at an average rate of 25 feet per year. A solution for Long Point's next century had to be as dynamic and outstanding as the natural system it sought to protect.

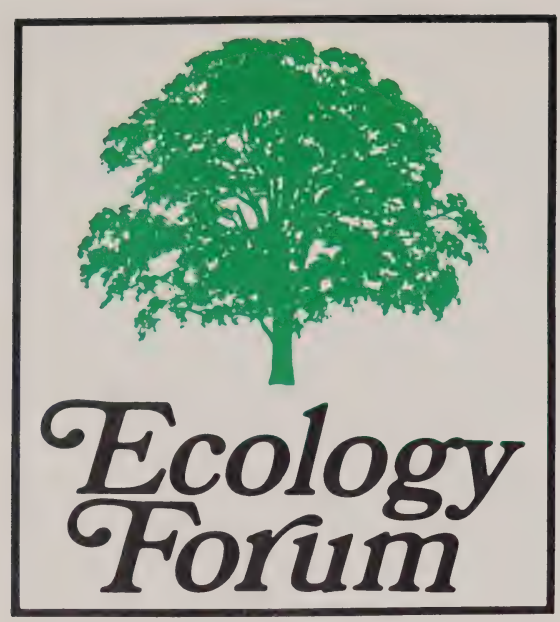
Four Canadian projects preceded the bilateral efforts to save Long Point:

William MacCormack Park on Cape Breton Island, Nova Scotia, was donated to the Conservancy in 1973 by its U.S. owners, Mr. and Mrs. Edward Russell. Containing frontage on Lake Bras D'Or, the 7-acre forested tract was subsequently transferred to The Nature Conservancy of Canada and then, several years later, was leased to the Provincial Department of Lands and Forests for management as a nature park.

In 1973 Mr. Russell Arundel, another U.S. landowner, gave **Outer Bald Island,** in the Tusket Islands of Nova Scotia, to the Conservancy. Despite its small size—4 acres—the tiny isle has breeding populations of arctic, common, and roseate terns, Leach's petrels, bank swallows, and savannah sparrows. Outer Bald Island was transferred to the Canadian Nature Conservancy; today the island and its rookeries are protected by the Nova Scotia Bird Society.

A partial interest in a critical 65-acre inholding in **Cape Scott Provincial Park** on Vancouver Island, British Columbia, was donated to the Conservancy in 1976 by Mr. Philip S. Padelford. Now included in the province's park, the wooded area fronts on Nels Bight, a spectacular 2-mile white, sandy beach. It is also adjacent to Hansen Lagoon, one of the most frequented waterfowl feeding and resting grounds on the Pacific Flyway.

Particularly known for its nesting concentrations of endangered bald eagles, **Russell Tract** is being managed by The Nature Conservancy of Canada. The U.S. Nature Conservancy received the 600-acre gift on Cape Breton Island early in 1978 from Miss Diana Russell and Miss Margaret Angela Russell, daughters of the donors of William MacCormack Park. It is hoped that the gift will be the first in a series of donations that will create a ridge-top nature trail on the island.



No. 32
by Robert E. Jenkins

INTERNATIONAL HERITAGE PROGRAMS?

Identifying and establishing ecological reserves in countries besides the U.S. has always been a Conservancy objective, though seriously pursued only intermittently in the organization's history. The Conservancy's precursor organization, the Ecological Society's Special Committee for the Preservation of Natural Conditions, did not distinguish between conservation objectives in the U.S. and elsewhere. The *Naturalist's Guide to the Americas,* published by the committee in 1926, consisted of more than 125 separate papers, mostly individual descriptions of ecosystems and nature reserves of individual states, regions, or countries. Coverage extended from northwest Greenland and the American Arctic Archipelago, clear through Mexico and Central America to Ecuador and the Amazon valley; and from Bermuda and the West Indies to the Galapagos and the Philippines. From 1962 to 1969, The Nature Conservancy maintained a "Latin American desk," through which it primarily attempted to aid and encourage the operation of Conservancy-like organizations elsewhere in the hemisphere. The current International Program has been more direct, concentrating on protection of a variety of magnificent ecological reserves. Considering the scope and pace of landscape destruction in Latin America, a recent staff conference on long-range plans easily produced a consensus that conserving natural diversity in the American tropics should be an immediate priority for intensified Conservancy action.

It is enlightening to read the 1926 *Naturalist's Guide.* In the intervening 53 years the hemisphere has experienced great changes—we can only wish that the *Guide's* early descriptions still applied: "much of Mexico remains in essentially primeval condition" (p. 593); "the original fauna (of Honduras), even in cleared areas, seems to have been relatively little modified . . . great areas of the country are absolutely primeval" (p. 602); "since the wildlife of Colombia is so little changed from its primeval state . . . no areas have been set apart as reserves" (p. 626); "the effect of human occupation (of the Guianas) has had slight effect on the native fauna except near the coast" (p. 660); and, in the area with which I am personally most familiar, "Costa Rica is a naturalist's paradise . . . with the most varied fauna and flora in so tiny an area of the New World . . . an unparalleled diversity of conditions. . . . The greater part of Costa Rica is still in primeval and unspoiled condition. . . . At least 75 percent of the tropical rain forest is still primeval wilderness. There is no satisfactory evidence that a single species is in danger of extermination. . . . Consequently, while there are no preserves, none are as yet really needed" (p. 609).

However, there were some dark forebodings: "It would be premature, for this Venezuela, to try to define the territories to be kept as reservations. Forest destruction and nature defacing is the actual program . . . as everywhere in (tropical) America" (p. 648); "Salvador is the most densely populated American republic except Haiti, and nearly all the arable land . . . is under cultivation . . . but Eastern Salvador is still mostly in its original state. There are still large areas left . . . on some of the isolated peaks . . . all these natural forested areas are likely to disappear within the next 25 years" (p. 603).

These dire predictions have been more than borne out. El Salvador has been stripped, less than a quarter of Costa Rica's rain forest remains, and to varying degrees the same story has been repeated everywhere. During these same years of destruction, the importance of the tropics to the ecology of the whole planet has begun to be recognized. The loss in diversity of species, communities, and other irreplaceable resources has been viewed with increasing alarm all over the globe. Nearly every conservation organization has agonized over the problem of tropical conservation; indeed, it forms the fundamental thread running through the new World Conservation Strategy developed by International Union for the Conservation of Nature and Natural Resources. The Conservancy's own current effort is itself part of the

international reawakening. In terms of diversity preserved for dollar invested, the Conservancy's International Program has already been the most cost-effective effort within the organization, and we are casting about for ways to make it even more so.

Tropical conservation is hindered by the awesome ecological complexity and by our appalling ignorance. The situation calls for a more systematic approach. It is clearly no longer "premature . . . to try to define territories to be kept as reservations," and conservationists from many regions and organizations are urgently and convergently attempting to find a more orderly procedure for doing so. Leading national conservation efforts, such as one going on in Costa Rica, have established strong national park and nature reserve programs and are attempting to identify other areas that can collectively represent all of the biophysical provinces and ecosystems in the country. Regional and international programs have assisted such national efforts, notably the World Wildlife Fund, International Union for the Conservation of Nature and Natural Resources, the Tropical Science Center, and the Wildlands and Watersheds Program of CATIE at Turrialba, Costa Rica. Many of these efforts provide technical assistance and manpower on a supranational basis, as did the Smithsonian/Peace Corps program until its untimely demise. For the Conservancy's part, we have been exploring the feasibility of using State Natural Heritage methodology in the neo-tropics. Such efforts face substantially greater difficulties than in the U.S.; so it seems that considerable adaptation of the heritage program may be required.

The first problem is the extreme diversity encountered in the tropics, where there may be more species of plants and animals in an area the size of West Virginia than there are in all of the contiguous United States. Numbers of endangered species to be dealt with, for example, are enormous. Furthermore, the problem is compounded by the inadequacy of existing information, much of which is widely scattered in repositories far from the country of origin. Classifying community or ecosystem types—to serve as a "coarse filter" for capturing natural diversity—would seem, therefore, to be a method of even greater importance in the tropics. But this type of classification is more difficult in tropical areas because great changes in community composition may occur over very short distances, even though the physiognomy or actual appearance of the vegetation hardly changes at all. Classifying ecosystems or communities has, nonetheless, been pursued with some sophistication, especially through regional life-zone mapping. So this may be a crucial building block for a successful program.

Besides the biological complexity of the tropics, there are institutional problems as well. Many of the Latin American countries have no well-developed conservation tradition. Financial and manpower resources may be quite limited, with an absence of the sort of infrastructure among agencies, private organizations, legislative authorities, and protection programs that exist in developed nations. Economic development almost always takes precedence, while any form of resource conservation becomes a secondary consideration. How, in this context, to guarantee the continuity of an evolving information system is as yet unclear. It must also be admitted that many of the Latin American countries are distrustful of nearly any initiative from developed nations. They question the motives behind international conservation and are frequently offended by what they regard as condescending offers of assistance. The result is that Latin American Natural Heritage Programs would have to accomplish more with less while contending with unique institutional problems.

Nevertheless, the potential benefits are enormous, the need is obvious and pressing, and no one has proposed a better approach. In spite of the difficulties, there is an almost insurmountable opportunity to make an important contribution for the benefit of Latin America and the rest of the world. Therefore we are continuing our investigations with the intention of implementing one or more experimental programs in the relatively near future.

Mark N. Beach

It is with deep regret that we announce the death of Mark Neal Beach, former Vice President of Development for the Conservancy. Mr. Beach, who had retired earlier this year, died on June 18 in an accident at his farm in Waterford, Virginia.

Before joining the Conservancy in 1976, Mr. Beach had been the development director of the National Trust for Historic Preservation in Washington, D.C., and development director for the Washington Cathedral. Under his direction, the Conservancy's Development Department launched the very successful Land Preservation Fund, designed to build the organization's revolving funds to $20 million. He also sparked the membership program, which has resulted in an increase of 35,000 members since 1976. Mr. Beach was a native of Port Huron, Michigan.

NEW PROJECTS

California

IONE CHAPARRAL (Amador County). The Ione Formation, a combination of kaolinitic clay, quartz sand, and ironstone, occurs in outcroppings over the 38-acre property. Although the extremely acidic and mineral-deficient soil is a hostile environment for most plant life, it is the unique habitat necessary for a few rare plants: Ione manzanita *(Archtostaphylos myrtifolia)* and *Eriogonum apricum* var. *prostratum*. The property will be transferred to and managed by the California State Wildlife Conservation Board.

Connecticut

JUNIPER HILL—Addition—(Town of Middlebury). The major features of this 14-acre addition are a talus slope and a buttonbush-moss vernal pool. Adjacent to the 133-acre Juniper Hill Natural Area, the addition and the existing preserve will be transferred to the Middlebury Land Trust for management.

Florida

CHASSAHOWITZA NATIONAL WILDLIFE REFUGE (Citrus County). A gift from Alico, Inc., the 526-acre property is primarily salt marsh and some small islands with live oak and cabbage palm. The area provides important habitat for a large concentration of wintering waterfowl and wading birds including redheads, canvasbacks, widgeons, pintails, osprey, and endangered brown pelicans. The property will be conveyed to the U.S. Fish & Wildlife Service for inclusion in the refuge.

JANET BUTTERFIELD BROOKS PRESERVE —Addition—(Hernando County). A gift of Janet Brooks, this 5-acre parcel enlarges the high hammock, longleaf pine, turkey oak, and loblolly pine forested Sanctuary to almost 300 acres. The sanctuary is managed by the Florida Chapter.

MOYA SANCTUARY (Glades County). Two state endangered species, the Florida sandhill crane and Audubon's caracara, are protected on this 80-acre preserve, a gift of Dr. Frank Moya. A large creek flows through the property's varied habitats which include live oak hammocks, second-growth cypress, pine flatwoods, and prairies dotted with sabal palm. The area will be managed by the Florida Chapter along with the 80-acre Floraglades Sanctuary which is nearby.

OSBORN SANCTUARY (Lee County). Bald eagles and brown pelicans hunt the shallow waters of Hendry Creek which flows through this 640-acre gift from V. H. and Meta Osborn. The salt marshes, mangrove forests, and islands of slash

pine, live oak, and sabal palm are also home to Florida manatee and American alligator. Tarpon, snook, and many other species of fish go through the first stages of life in the creek before moving out into Estero Bay. The area will be managed by the Ft. Myers-Lee County Junior Museum and Nature Center.

Idaho

BIRDS OF PREY—Addition—(Ada and Elmore Counties). Over 566 pairs of 14 species of birds of prey, including the endangered peregrine falcon, golden eagle, prairie falcon, ferruginous hawk, red-tailed hawk, American rough-legged hawk, and American kestrel, nest in the rocky ledges and pinnacles of the Bureau of Land Management's Snake River Birds of Prey Natural Area. This 127-acre inholding will give added protection to the birds' habitat. Purchased with funds provided by the Elmer Feldenheimer Land Preservation Fund, the property will be managed by a Conservancy resident preserve manager under the supervision of the Northwest Field Office.

Kansas

KONZA PRAIRIE—Addition—(Riley County). Bordered on the north, east, and south by the original 8,136-acre Konza Prairie, the 480-acre addition is a dissected bluestem prairie and contains the headwaters of a prairie watershed. The addition will facilitate fencing and research on the entire preserve. Through a lease arrangement, management will be the responsibility of Kansas State University's Department of Biology. Funding for the project came from the Katharine Ordway Land Guardian Fund.

Maryland

FINZEL SWAMP—Addition—(Garrett County). A 22-acre parcel will become a part of the 285-acre Finzel Swamp Preserve protecting a remnant Ice Age community—a unique northern bog in a southern latitude. The area provides refuge for the star-nosed mole and jumping mouse and for such plant species as black calla *(Calla palustris),* larch or tamarack *(Larix laricina),* and highbush blueberry *(Vaccinium corymbosum).* The headwaters of the Savage River, a tributary of the Potomac River, are located along the south border of the property. Management of the area will be the responsibility of the Maryland Chapter in cooperation with Frostburg State College.

JANES ISLAND (Somerset County). A 38-acre loblolly pine forest with some willow oak, southern red oak, sweet gum, black gum, and red cedar in the understory is an addition to the Janes Island State Park. Portions of the property are adjacent to the Daugherty Creek Canal, which separates the mainland from Janes Island. The property will be transferred to and managed by the Department of Natural Resources of the State of Maryland.

SENECA CREEK — Addition — (Montgomery County). Located in the suburbs of Washington, D.C., these 371 acres of woodland, pastureland, and wetlands contain two tributaries which run through the property and feed into Seneca Creek. The property has been transferred to the Maryland Department of Natural Resources for inclusion in the Seneca Creek State Park.

Minnesota

HOLE-IN-THE-MOUNTAIN PRAIRIE—Addition—(Lincoln County). Consisting of a deep ravine and including most of the headwaters of the main ravine which dissects the prairie, this 90-acre addition brings the total area of the preserve to 246 acres. The preserve is habitat for the federally threatened Dakota skipper butterfly, the pawnee skipper butterfly, and the ottoe skipper butterfly, which is a candidate for federal protection. The prairie preserve is managed by the Minnesota Chapter.

Missouri

VICTORIA GLADE (Jefferson County). A glade is a natural opening in a forest containing both prairie species, particularly grasses, and species adapted to rocky, desert-like conditions. Victoria Glade, a 195-acre area in eastern Missouri, is the best-known example of this ecotype in the glade region, and the only protected example. It consists of 110 acres of oak-hickory forest and an 85-acre cedar glade occurring on an outcrop of thin-bedded dolomite or dolomitic limestone. Twelve native grasses and 75 wildflower species have been identified on Victoria Glade, including lead plant, asters, sedge, shooting star, foxglove, bush clover, blazing star, violet wood sorrel, Missouri coneflower, goldenrod, vervain, and Fremont's leather flower, an endemic to eastern Missouri glades. Purchased with funds provided by the Richard Pough Land Preservation Fund, the area will be leased to and managed by the Missouri Department of Natural Resources.

Montana

PINE BUTTE SWAMP — Addition — (Teton County). Adjacent to the Bob Marshall Wilderness Area, this 2,200-acre parcel, while not a part of the swamp, provides habitat for a variety of species and has frontage on the Teton River. Elk, deer, moose, Rocky mountain sheep, mountain goats, black bears, bobcats, lynx, cougars, and mink share the property with grizzly bears, golden eagles, and

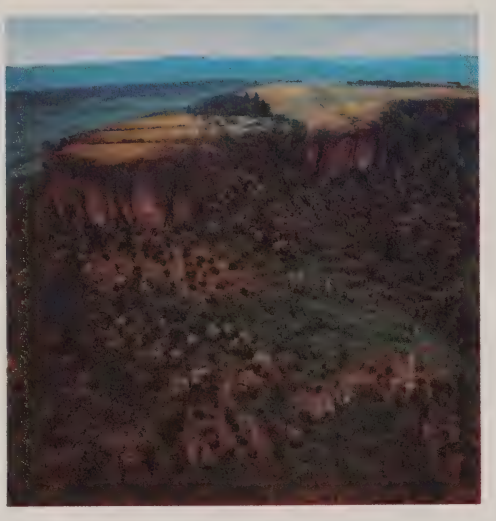


Table Rock

During the Pliocene epoch, roughly 2 to 13 million years ago, basalt lava flowed from erupting volcanos in southwestern Oregon. The lava cooled and most of it, along with much of the underlying sandstone sediment, has eroded away leaving a horseshoe-shaped mesa known today as Lower Table Rock.

Towering 700 feet above the Rogue River, the Rock, with its unusual soil types and rocky steep slopes, provides secure habitat for an abundance of wildlife. Over 86 plant species have been identified on the rock, including rare Henderson's fawn lily, scarlet fritillary, and the checkerlily. Endangered dwarf meadow foam, endemic to Table Rock, flourishes at the edges of several vernal pools. Raptors nest on the craggy talus walls of the Rock in company with western blue grey gnatcatchers in the northernmost fringe of their range.

A scenic and historic landmark, Lower Table Rock was identified by the Oregon Natural Heritage Program as a top priority site for protection. To date, the Conservancy has purchased 750 acres on Lower Table Rock, protecting it from encroaching development in fast-growing Jackson County. The Oregon Field Office has mounted a fund-raising campaign for $500,000 to preserve and manage an eventual total of 2,000 acres of Lower Table Rock, Kelly Slough, a neighboring riparian habitat, and the lush valley between them.

sandhill cranes. The property also contains Indian buffalo jumps and pine stands which are important grizzly forage. The Conservancy will manage the property until it is transferred to the U.S. Fish & Wildlife Service.

New York

THOUSAND ACRE SWAMP — Addition — (Monroe County). This 25-acre parcel is a critical link between two other Conservancy-owned parcels. Its acquisition now provides unbroken access across the Conservancy's entire current holdings in the area, now totaling almost 150 acres. The swamp is habitat for the rare Massasauga rattlesnake and is managed by the Thousand Acre Swamp Committee of the Western New York Chapter.

Ohio

COMPASS PLANT PRAIRIE (Lawrence County). This 20-acre property may be the only Ohio location for the compass plant *(Silphium lacinatum)* which is disjunct by some 150 miles from its normal range. The property also supports numerous other prairie species such as big bluestem *(Andropogon gerardi)*, little bluestem *(Andropogon scoparius)*, dropseed *(Sporobolus asper)*, and ladies' tresses *(Spiranthes gracilis)*. Management of the area will be the responsibility of the Ohio Chapter until the property is transferred.

SPRINGVILLE MARSH (Seneca County). One of the largest marsh remnants in the till plain section of western Ohio, the 160-acre marsh represents an excellent example of an assemblage of communities which were never common in Ohio and are now relatively rare. The marsh contains five community types: streams, ponds, cattail marsh, sedge meadow, and swamp forest; and provides nesting and migratory resting area for a variety of shorebirds. Six species found on the tract—twig-rush, beaked spike-rush, small yellow sedge, long-beaked willow, yellow avens, and shrubby cinquefoil—are currently considered by the Ohio Natural Heritage Program as threatened or potentially threatened in the state. The property will be transferred to the Ohio Department of Natural Resources and dedicated as a State Nature Preserve.

Pennsylvania

LACAWAC SANCTUARY—Addition—(Wayne County). To be named in honor of Harry R. Van Deusen, Jr., a longtime supporter of the sanctuary, the 18-acre property is adjacent to the preserve. The sanctuary's 50-acre lake is considered to be the southernmost unpolluted glacial lake in North America. The lichens, mosses, pioneer tree growth,

and beaver-dam succession on the property add new opportunities for study under Lacawac's active educational program. The area will be managed by the Lacawac Sanctuary Committee and the Eastern Pennsylvania Chapter.

Tennessee

BORDEAUX HERON ROOKERY (Davidson County). The 6-acre site, located in Nashville, has been used as a rookery by black-crowned night herons since 1908, and currently contains approximately 50 nests. This species is presently on the "in need of management" list in Tennessee and is considered threatened in the state. A joint fund-raising project of the Tennessee Ornithological Society and the Cumberland-Harpeth Audubon Society, the property has been transferred to the Tennessee Wildlife Resources Agency for management.

Washington

LITTLE SPOKANE RIVER—Addition—(Spokane County). The 32-acre acquisition is essentially buffer land for the Little Spokane River Park. The Little Spokane, a tributary of the Spokane River, is maintained as a nearly pristine riparian corridor. The overall area harbors a great blue heron rookery, painted turtles, spotted frogs, kingfishers, water ouzel, western kingbirds, Bullocks orioles, western tanagers, cinnamon teals, golden eagles, and many species of fish. The area will be transferred to the county for management.

West Virginia

MONONGAHELA NATIONAL FOREST—Addition—(Randolph County). Several plant and animal species found on this 156-acre tract are listed in the State Heritage Program's data bank of rare or threatened natural elements. They include the beaked dodder, coneflower, northern flying squirrel, rock vole, and the Cheat Mountain salamander which is endemic to the area and is being considered for placement on the federal list of threatened or endangered species. Funds for the purchase of the inholding in the Monongahela National Forest will be provided by the Claude Worthington Benedum Land Preservation Fund. The property will be transferred to and managed by the U.S. Forest Service.

Two Special Conservancy Tours

VIRGINIA COAST RESERVE

Miles of sandy beaches. Acres of green marshes. Timeless rolling tides. The Conservancy's Virginia Coast Reserve is one of the few segments of our coastline that looks much as it did 200 years ago. The 33,000-acre system contains all or part of Metomkin, Cedar, Parramore, Revel's, Sandy, Hog, Rogue, Cobb, Ship Shoal, Godwin, Myrtle, Mink, and Smith Islands. All the islands support huge concentrations of shorebirds, seabirds, and waterfowl.

The Conservancy is offering its members the opportunity to visit one of these pristine islands. We are sponsoring a trip to Hog Island on the weekend of October 13-14, 1979. It is a rare chance to see not only an area that you have helped protect, but also one of the most unspoiled ecosystems remaining in our country.

ADIRONDACK MOUNTAIN PRESERVES

Virgin forests of towering trees . . . high flower-covered peaks . . . jewel-like glacial lakes and ponds . . . 30,000 miles of clear rivers and streams . . . thundering waterfalls and foaming rapids. . . . Containing 9,000 square miles in northern New York, the Adirondack Park is the largest protected sanctuary in the continental U.S. It is so expansive that much of its interior land is still relatively unexplored.

The Adirondack tour offers Conservancy members and their guests the chance to visit the Park on the weekend of September 28-30, 1979. You will learn about the role that the Adirondack Conservancy has played in preserving this vast wilderness, stay at the famous and historic Ausable Club, and visit the Conservancy's 12,500-acre Santanoni Preserve within the Adirondack Park. Don't miss this trip to "the land nobody knows."

For applications and additional details for the VCR tour and the Adirondack trip, write to The Nature Conservancy Tours, P.O. Box 3611, Washington, D.C. 20007; or call 202/466-6307.

CONSERVATION AWARDS

The Conservancy's efforts have been well recognized again this year by the American Motors Conservation Awards Program. Four individuals affiliated with the Conservancy, a Florida conservation organization, and five Conservancy members received awards for 1979.

In the professional category, **Dennis Wolkoff** was honored for his role as Conservancy Indiana Field Representative. He not only increased land preservation activities in Indiana, but also inspired the development of the Indiana Natural Heritage Program. Mr. Wolkoff recently accepted a one-year position as Director of Development for the Conservancy's southeast region.

Three other people received awards in the nonprofessional category. A leader both in the business world and in the field of conservation, **Daniel W. Lufkin** is a member of the Conservancy's Board of Governors and Co-chairman of the Corporate Relations Committee. Mr. Lufkin was the first commissioner of the Department of Environmental Protection for the State of Connecticut. He is credited with developing the first comprehensive solid waste management plant to be adopted by any state.

As Chairman of the Conservancy's Vermont Chapter, **Hubert W. Vogelmann** was honored with an award for his involvement in acquiring 26 natural areas totaling over 30,000 acres in the state. He has negotiated with landowners, found donors, and raised funds. Largely because of Dr. Vogelmann's efforts, 15 square miles of the Green Mountains (Burt Forests) were acquired by the Conservancy in 1977. He is professor of botany and Chairman of the Botany Department at the University of Vermont.

Both **Willard V. Merrihue** and the organization for which he has worked so diligently have received 1979 American Motors Conservation Awards. A retired businessman, Mr. Merrihue offered his assistance to the **Collier County Conservancy** shortly after he moved to Florida. Under his leadership, the small but active group of conservationists has become one of the strongest environmental organizations in the South. The Collier County Conservancy has made major contributions to the protection of the environment along the southwest coast of Florida; it led the way in creating the Rookery Bay Sanctuary, a vast preserve near Naples for which The Nature Conservancy acquired over 3,000 acres. Two Conservancy-preserved areas, Fakahatchee Island and Ten Thousand Islands, are under the care and protection of the Collier County Conservancy.

Five members of The Nature Conservancy also were named award winners this year. A biologist with the Bureau of Land Management, **Kristin H. Berry** has dedicated both her professional and her private life to protecting desert resources. She is best known for her relentless campaign to gain protection for the endangered desert tortoise—an effort that led to the creation of the Desert Tortoise Preserve. Dr. Berry also formed the Desert Tortoise Preserve Committee, a Conservancy-related citizen group that has actively raised funds for acquiring additional land for the tortoises. **Frank C. Bellrose** is honored for his investigations of lead poisoning in waterfowl and his crusade supporting the use of non-toxic shot. His efforts have greatly reduced the tremendous destruction of birdlife. Dr. Bellrose is the author of *Ducks, Geese, and Swans of North America* and numerous articles. A member of the Minnesota Environmental Education Council, **Pamela Best Landers** was instrumental in designing the Minnesota Environmental Education Plan. She carried out "Project Coexistence," a program that informs landowners of conservation needs and the importance of wildlife habitat.

In the nonprofessional category, **Daniel Chapin** is an active and dedicated member of The California Waterfowl Association. Under his leadership, the association preserved the state's most important wintering habitat for waterfowl. Mr. Chapin also drafted the legislation that was adopted to raise money for wetland programs. **Alice Q. Howard** was honored for her 14-year leadership of the California Native Plant Society, which is dedicated to preserving the state's native flora. Her persistent efforts were a large factor in passage of the 1978 amendment to the Endangered Species Act, which authorized federal/state cooperative programs to protect plant life.

Correction

We would like to clarify the article on the North Star Ranch which appeared in the January/February 1979 issue of the *News*. The Nature Conservancy acquired a 175-acre portion of the ranch from Mr. and Mrs. James H. Smith—not the entire ranch, as was implied in the article. Mr. and Mrs. Smith still reside at North Star and plan to stay for some time.

PHOTOS: Susan Bournique, inside front cover, p. 5 top and right, p. 26; Bart de Boer, p. 16 top right; Jane Frick, pp. 17 lower right, 19; Edward Gowans, p. 28; Heather Iler, p. 22 left; Daniel H. Janzen, p. 9 top; Phil Yunger, p. 12 bottom; all others by R. Michael Wright.

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An individual becomes a Life Member of The Nature Conservancy upon contribution of $1,000 for membership dues.

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Massachusetts

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A corporation becomes a Corporate Associate of The Nature Conservancy upon contributing between $1,000 and $10,000 annually to the operations of the organization.

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Timothy Barnett, Director

CORRECTION—The words "and for the Bylaws revisions" on the Official Ballot are in error and should be omitted. The Bylaws revisions will be voted on at the Annual Meeting by those members present.

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Address Correction Requested

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